



RECOFI Technical Workshop on Spatial Planning for Marine Capture Fisheries and Aquaculture Doha, Qatar 24–28 October 2010



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**Main issues in aquaculture, mariculture
and marine capture fisheries in the
RECOFI Region with particular attention
to issues that are spatial**

**James McDaid Kapetsky and Geoff Meaden
FAO Consultants**

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Part 1 Mariculture Issues



Spatial Issues in Aquaculture from a Global Perspective

- ⊙ GIS training and promotion
 - **Training/Capacity building**
 - **Promotion (Awareness building/appreciation)**
- ⊙ GIS aimed at the development of aquaculture
 - **Suitability of the site and zoning**
 - **Strategic planning for development (e.g., estimating potential for mariculture)**
 - **Anticipating the consequences of aquaculture**
 - **Economics**

Spatial Issues in Aquaculture from a Global Perspective (Continued)

- GIS for aquaculture practice and management
 - **Inventory and monitoring** of aquaculture and the environment
 - Environmental impacts of aquaculture
 - **Web-based or networked aquaculture information systems (e.g., RECOFI/RAIS)**
- GIS for multisectoral development and management that includes aquaculture
 - **Management of aquaculture together with fisheries**
 - **Planning for aquaculture among other uses of land and water**

General Issues in Aquaculture in the Arab States

⊙ Natural resources

- Utilisation of water resources
- Loss of ground water
- Contaminated water
- Shortage of suitable coastal waters
- Effects of urbanisation in coastal areas

⊙ Technical shortfalls:

- Lack of experience in fish culture
 - *fish health management*
 - *culture of local species*
- Shortage of scientific references and literature on the subject

- (Source: Feidi (2010);
<http://www.thefishsite.com/articles/873/opportunities-for-aquaculture-in-the-arab-states>)

General Issues in Aquaculture in the Arab States

- ⊙ **Management obstacles**
 - Poor management practices and planning
- ⊙ **Economic shortfalls:**
 - High cost of operating farms
 - High initial capital investment
 - Lack of concessional credit financing
- ⊙ **Feed shortages:**
 - Shortage of locally produced feeds
- ⊙ **Manpower shortages:**
 - Experts
 - Local consulting firms
 - Well trained manpower
- ⊙ **Legal obstacles:**
 - Lack of aquaculture legislation to regulate activities

Issues Specific to Cage Culture in the RECOFI Region

- **Limited availability of suitable farming sites due to:**
 - **Shallow waters**
 - **Highly fluctuating salinity and temperature levels**
 - **Inadequate current speeds**
- **Other issues:**
 - **Price competition from wild-caught fish**
 - **Inadequate farming technologies**
 - **Limited availability of endemic candidate species of commercial importance suitable for cage aquaculture**
- *Source: The Fish Site*
<http://www.thefishsite.com/fishnews/9831/new-plan-for-sustainable-cage-aquaculture-in-oman>)

Issues Perceived from the Questionnaires and the Literature

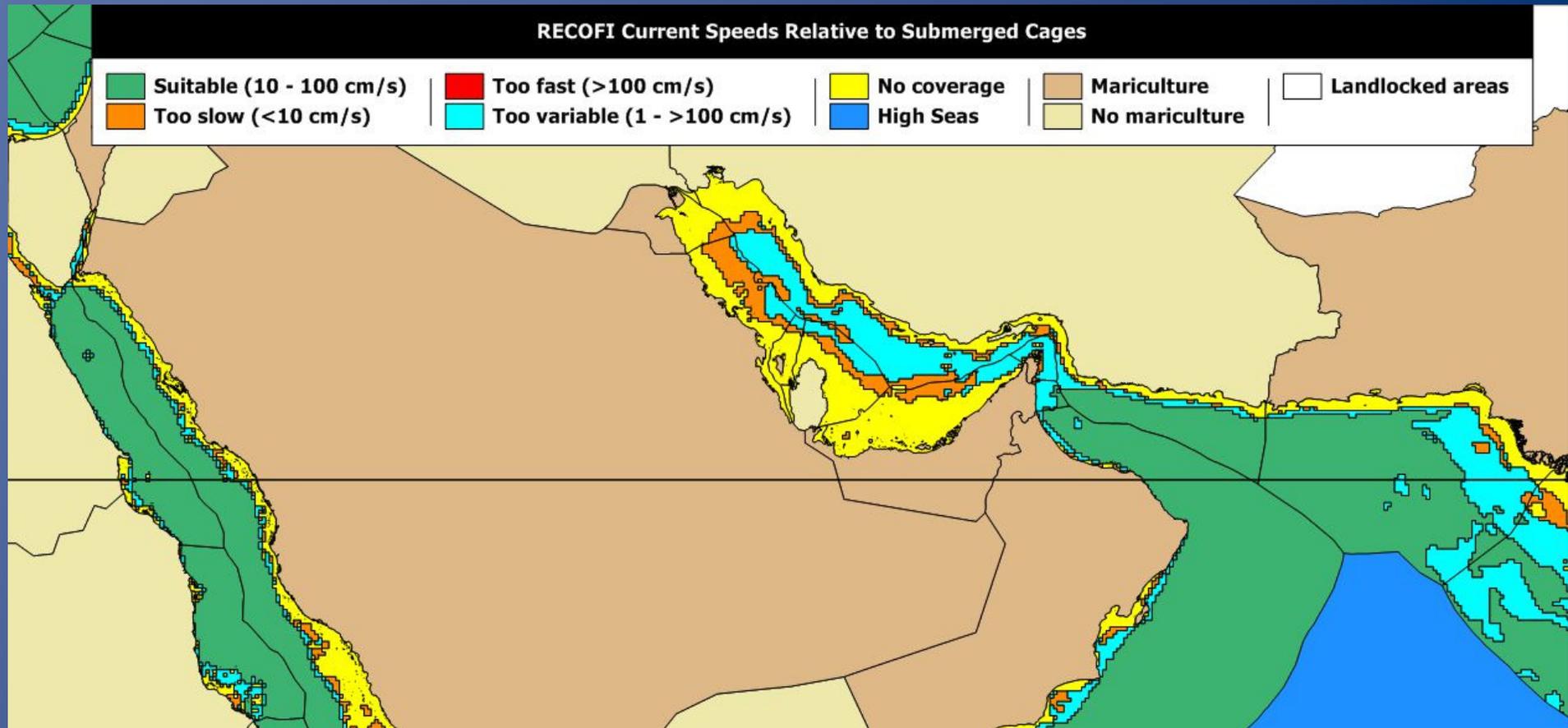
- ⦿ **Lack of spatial planning for development and management**
- ⦿ **Lack of broad experience:**
 - **Mariculture not yet developed in some countries**
 - **Not yet fully developed in remaining countries**
- ⦿ **Physical limitations:**
 - **Coastline length and EEZ area vary greatly among the countries**
 - **Current speeds and depths fall outside of optimum threshold ranges in much of the area (e.g., cobia)**

Coastline Lengths in the RECOFI Region

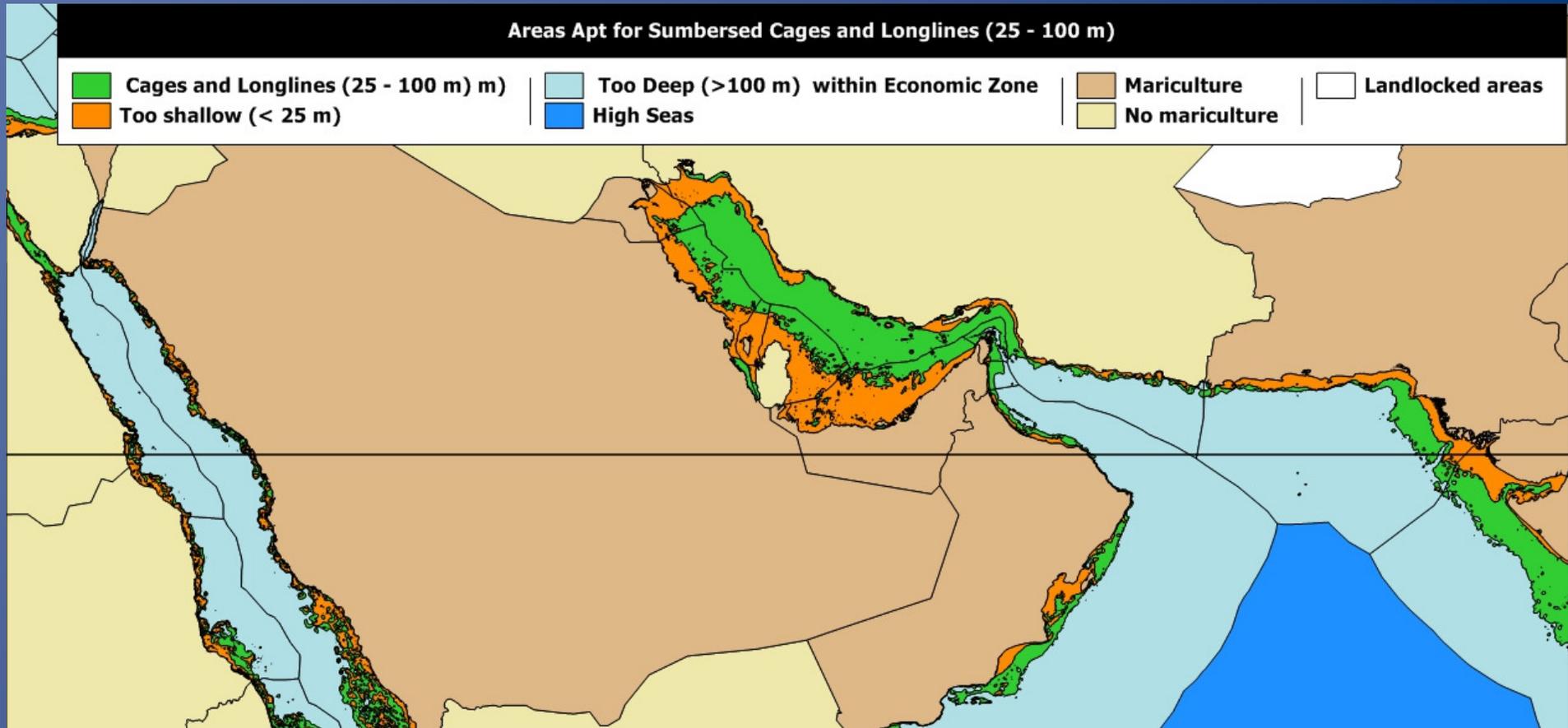
Table 3 Coastline lengths of the RECOFI countries

Country	Coastline (km)
Iran IR	2440
Oman	2092
United Arab Emirates	1318
Qatar	563
Saudi Arabia*	800
Kuwait	499
Bahrain	161
Iraq	58
Total	7931
*An additional 1840 km are on the Red Sea	

RECOFI Region - Current Speeds Relative to Submerged Cages



RECOFI Region - Depths for Submerged Cages



Conclusions on Mariculture Issues

- **Nearly all of the issues are spatial, or have components that are spatial and thus lend themselves to analysis by GIS**
- **These issues are difficult, but not insurmountable**
- **Implementation of a spatially based strategy for mariculture can accelerate development that is sustainable and that will enhance management**

Part 2 Marine Fisheries Issues

Some major issues identified in the questionnaire for marine capture fisheries in the RECOFI Region

- “Inventory of species and fishing effort”
- “Effects of pollutants and algal blooms”
- “Difficulties in data acquisition”
- “External influences on the marine environment”
- “No data on fishing locations or catches”
- “Lack of ecosystems data, e.g. depth, temperatures, etc”
- “Over-exploitation of trans-boundary stocks”
- “Unmanaged excess fishing capacity”
- “Seasonal variations of marine hydrography”
- “Spawning grounds of commercially important species”
- “Location of landing and processing sites”
- “Mapping of potential fishery zones”

Some major issues identified by Gary Morgan (FAO, 2006) for marine capture fisheries in the RECOFI Region

- ⦿ Destruction of coastal (and other) habitats
- ⦿ Problem of shared stocks and intrusions into neighboring marine space (no recognition of EEZ's)
- ⦿ Rapid decline of stocks
- ⦿ Extent of illegal fishing and difficulty of monitoring this
- ⦿ Fleet over-capacity, especially of artisanal boats
- ⦿ Little idea of existing stocks
- ⦿ Minimum fisheries management
- ⦿ Hostile marine environment for many species
- ⦿ Rapid growth in recreational fisheries in some states

Some additional issues identified by Geoff Meaden for marine capture fisheries in the RECOFI Region (relating to implementing spatial planning)

- ⦿ Lack of adequate marine data sets
- ⦿ Lack of marine spatial planning and appreciation of this
- ⦿ Little data on socio-economic aspects of fisheries
- ⦿ Difficulty of collecting data from artisanal fishers
- ⦿ Implementing an awareness of the need for marine conservation and ecosystems sustainability
- ⦿ Need for strong cooperation between RECOFI states
- ⦿ Sufficient appreciation of the wide capabilities and benefits of spatial analyses